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NPIC/TSSG/DED-1566-69
3 April 1969

MEMORANDUM FOR: Chief, Technical Services & Support Group

SUBJECT : Schedule of Advanced Rhomboids Model II

1. During a recent inspection visit to [redacted] it was discovered that there is an excessive amount of "flare" in the optical system at certain magnification settings. Flare is not a truly basic defect in the sense that it is neither an aberration nor a distortion. Flare results from reflections at the lens surfaces. When lenses are compounded of several lens elements (which is normally done in order to reduce aberration), flare often becomes a problem because it normally increases with the number of surfaces. The result is light loss by reflection which decreases image brightness and at the same time decreases contrast because part of the light is scattered onto the image plane. 25X1

2. The basic Zoom 240 has a zoom magnification range of from 0.7 to 3.0. This basic element when used with a 10X eyepiece results in magnification from 7X through 30X, and with a 20X eyepiece magnification of 14X through 60X. When the zoom element moves from .7X through 2.0X the numerical aperture of the Zoom 240 is the limiting aperture of the system (Zoom 240 plus rhomboids) and the resulting image through the system is very sharp, crisp and pleasing. Above the 2.0 zoom position, i.e., 2.0 through 3.0, there is significant flare in the image because the controlling aperture of the system is in the rhomboid and not in the zoom element of the 240.

3. The solution to this problem lies in coating additional lenses, possibly cementing elements together which are not now cemented, and in general providing better alignment and fewer glass-to-air surfaces. The contractor feels that he can have the problem solved by the 10th of April primarily because they feel the optical design has a theoretical numerical aperture larger than that required. It is felt by Development and Engineering Division that the problem should respond to solution but that the contractor's estimated 10 April date is far too optimistic and that it probably will be late in April before the instrument will operate satisfactorily. This problem may not have major technical significance at this point. However, the impact upon the schedule with respect to purchase of these items during FY-69 could be quite significant. We will keep you continually informed as to progress in solving this problem.

[redacted]
Chief, Development & Engineering Division, TSSG

25X1

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